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The Impact of Remittances on Poverty and Inequality in Ghana

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Abstract

This paper uses a new, 2005/06 nationally-representative household survey to analyze the impact of internal remittances (from Ghana) and international remittances (from African and other countries) on poverty and inequality in Ghana. To control for selection and endogeneity, it uses a two-stage multinomial logit model with instrumental variables focusing on variations in migration networks and remittances among various ethno-religious groups in Ghana. The paper finds that both internal and international remittances reduce the level, depth, and severity of poverty in Ghana. However, the size of the poverty reduction depends on the type of remittances received. In general, poverty in Ghana is reduced more by international than internal remittances. For households receiving international remittances, the level of poverty falls by 88.1 percent with the inclusion of remittances; for households receiving internal remittances, poverty falls by 69.4 percent with the inclusion of remittances. The paper also finds that both types of remittances increase income inequality in Ghana. For households with internal remittances, the inclusion of remittances causes the Gini coefficient to rise by 4 percent, and for households with international remittances, the inclusion of remittances causes the Gini to increase by 17.4 percent.

This paper—a product of the Development Prospects Group, Development Economics Department and the Africa Region—is part of a larger effort in the department to understand the impact of migration and remittances on poverty and inequality in the developing world. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at radams@worldbank.org.

The Impact of Remittances on Poverty and Inequality in Ghana*

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Remittances refer to the money and goods that are transmitted to households by migrant workers working outside of their origin communities, either in urban areas or abroad. At the start of the 21st century, these resource transfers represent one of the key issues in economic development. While the total level of internal remittances in the developing world is unknown, in 2005 international remittances to the developing world amounted to US $191 billion (World Bank, 2008). In that year the level of international remittances was about 50 percent larger than the level of official development aid to the developing world.

What is the impact of these large remittance flows on poverty and inequality in the developing world? The answer to this question seems central to any attempt to evaluate the overall effect of migration and remittances on the developing countries of Latin America, Asia and Sub-Saharan Africa. While a number of studies have examined the impact of internal and international remittances on poverty and inequality in Latin America and Asia,[1] relatively few studies have tried to evaluate these issues in the region of the world where poverty rates are the highest: Sub-Saharan Africa.[2]

The purpose of this paper is to examine the impact of internal and international remittances on poverty and inequality in the Sub-Saharan African country of Ghana. Ghana represents a good case study for examining these issues. Not only is the estimated level of poverty high in Ghana,[3] but the country also produces a large number of internal migrants (to urban areas) and international migrants (to African and other countries). Since households in Ghana are more likely to produce internal rather than international migrants,

but the value of remittances received from internal migrants is much less than that received from international migrants, it is likely that these two types of resource transfers will have differing effects on poverty and inequality.[4]

At the outset it should be emphasized that any effort to examine the impact of remittances (internal or international) on poverty and inequality involves several important methodological issues. On the one hand, it is possible to treat remittances as a simple exogenous transfer of income by migrants. When treated as an exogenous transfer, the economic question becomes: How do remittances, in total or at the margin, affect the observed level of poverty and inequality in a specific country? This is the basic question addressed by Gustafsson and Makonnen (1993) in their study of remittances and poverty in Lesotho. On the other hand, it is also possible to treat remittances as a potential substitute for domestic (home) earnings. When treated as a potential substitute for home earnings, the economic question becomes: How does the observed level of poverty and inequality in a country compare to a counterfactual scenario without migration and remittances but including an imputation for the home earnings of migrants had those people stayed and worked at home? This latter treatment seems to represent the more interesting (and challenging) economic question because it uses econometric techniques to compare the level of poverty and inequality in a country with and without remittances.[5]

One of the contributions of this paper is that it develops counterfactual income estimates for migrant and non-migrant households by using econometric estimations to predict the incomes of households with and without remittances. However, this approach has its own methodological difficulties. Most notably, the attempt to predict (estimate) the incomes of migrant households on the basis of the observed incomes of non-migrant

households is subject to the problems of selection bias and endogeneity. If migrant and non-migrant households differ systematically in their unobservable characteristics (e.g. skills, motivation, ability), there will be selection bias in any estimates of income which are based on non-migrant households. We address this concern by using a two-stage multinomial logit selection model to test for selection bias in the household receipt of remittances. However, ensuring the exogeneity of the variables used in the specification of this selection model is not straight-forward. To address this issue we use an instrumental variables approach, focusing on variations in migration networks and remittances among various ethno-religious groups in Ghana. Based on the results of our selection model we then proceed to estimate an expenditure model that allows us to determine the impact of internal and international remittances on poverty and inequality in Ghana.

The paper proceeds in eight further parts. Section 1 presents the data. Since the problems of selection and identification are so important, Section 2 presents the two-stage multinomial logit selection model, and Section 3 discusses the various identification issues involved in estimating this model. Section 4 estimates the selection model using an instrumental variables approach, employing variations in migration networks and remittances at the ethno-religious level. Section 5 estimates the selection-corrected predicted expenditure functions, and Sections 6 and 7 use these predicted expenditures to analyze the impact of internal and international remittances on poverty and inequality in Ghana. Section 8 concludes.

1. Data

Data for this study come from the 2005/06 Ghana Living Standards Survey (GLSS 5), a new, nationally-representative survey of 8,000 households carried out by the Ghana Statistical Service (GSS). This survey, administered from September 2005 to September 2006, contains detailed information on all aspects of living conditions in Ghana, including income, expenditure, health, education, savings, and credit. As part of this survey, a supplemental migration and remittances module was administered to a nationally representative sub-sample of 4,000 households.[6] This paper uses the data from the migration and remittances sub-sample of 4,000 households. In carrying out the analysis we dropped 59 households because of missing data, which resulted in a sample of 3,941 households.

Since the focus here is on remittances, it is important to clarify how these income transfers are measured and defined. Data on remittances includes transfers received in three forms: (1) money (cash); (2) food; and (3) non-food goods.[7] While most remittances (about 75 percent) come in the form of money (cash), including food and non-food goods is important because it leads to a more accurate measure of the total flow of remittances to households in Ghana. In this study each household that is classified as receiving remittances – either internal (from Ghana) or international (from African or other countries) -- is assumed to receive exactly the amount reported in the survey. Households which report having migrants but do not report receiving remittances are classified as non-remittance receiving households. Using this definition distinguishes our work from much of the previous literature on migration and remittances by focusing on the origin of income flows rather than presence or absence of a migrant in the household. This approach seems

sensible for three reasons: (1) only about one-half of all migrants in Ghana remit; [8] (2) about 50 percent of all remittance-receiving households in the survey do not have a migrant; and (3) if we attempted to measure differences according to migration cum remittances behavior, the number of observations for each cell would be very small. In Ghana, where family ties are very strong, migration is different from remittances because households without migrants can receive internal or international remittances from relatives (e.g. cousins, aunts, uncles) and close friends.[9]

Table 1 presents summary data from the 2005/06 Ghana GLSS 5 Survey (sub-sample). Since we want to work with three exclusive groups of households, in this table and in all subsequent tables, we have dropped the 57 households that receive remittances from both internal and international sources. Of the remaining 3,884 households, 2,515 households (64.7 percent) receive no remittances, 1,159 households (29.8 percent) receive internal remittances (from Ghana) and 210 (5.4 percent) receive international remittances (from African or other countries).

Table 1 reveals several interesting contrasts between the three groups of households, that is, those receiving no remittances, those receiving internal remittances (from Ghana) and those receiving international remittances (from African or other countries). With respect to human capital, the table shows that households receiving international remittances generally have more human capital than households with no remittances, while households receiving internal remittances usually have less. The table also shows that households receiving international remittances have the highest mean per capita expenditure, while households receiving internal remittances have the lowest mean expenditure.

2. An Econometric Model of Household Incomes with Selection Controls

Since most poverty economists use expenditure rather than income data to identify poverty,[10] it is tempting to use the mean per capita expenditure figures in Table 1 to conclude that households receiving international remittances are less likely to be poor. However, it is important to realize that these expenditure figures are "naïve" and cannot be used to evaluate the "real" effect of remittances on poverty in Ghana. Households have both observed and unobserved characteristics. Since the expenditure results in Table 1 may be caused by the unobserved characteristics of households (e.g. skills, motivation, ability), it is important to use special econometric techniques to identify the impact of these unobservables in order to pinpoint the "real" impact of remittances on expenditures and poverty in Ghana.

Specifically, it is necessary to estimate a counterfactual scenario in which we estimate the expenditures for households that receive internal or international remittances, and then compare these expenditures with an unobserved scenario in which these households do not receive remittances. Constructing such a counterfactual can be done by treating households with no remittances as a random draw from the population, estimating a mean regression of incomes for these no-remittance households, and then using the resulting parameter estimates to predict the incomes of households with internal and international remittances. However, this approach becomes problematic if households with and without remittances differ systematically in their unobservable characteristics (e.g. skills, motivation, ability), because then the regression results will be biased. The approach followed in this paper is to estimate a different equation for each type of remittance-receiving household, taking into account in the estimation the selection bias. This kind of

approach is based on a selection model developed by Lee (1983) and Bourguignon, Fournier and Gurgand (2004).[11]

Assume that households can select between three states (r): (1) receive no remittances; (2) receive internal remittances (from Ghana); and (3) receive international remittances (from African or other countries).[12] Once households have chosen their state, they decide their level of expenditure $y_{r,}$ where y_r is the optimal expenditure for households that chose $r=r$. On this basis, we have a polychotomous-choice model (Lee, 1983), where we have an expenditure equation for each possible state *r*.

$$Y_r = \beta_r + a_r Z + u_r \quad (1)$$

And for each choice we have a latent variable:

$$I_r = X\psi_r + \eta_r \quad (2)$$

Notice that X is a set of characteristics of the households, which includes all variables in Z, plus instrumental variables. Now we have that:

$$I=r \text{ if } I_r > \text{Max } I_j \ (j=1,2,3,j\neq r) \quad (3)$$

$$\text{Let } \varepsilon_r = \text{Max } I_r - \eta_r \ (j=1,2,3,j\neq r) \quad (4)$$

If η_r follows a type I extreme value distribution, Domencich and McFadden (1975) show that ε_r has the following distribution function:

$$F_r(\varepsilon)=\text{Prob}(\varepsilon_r < \varepsilon)=\exp(\varepsilon)/(\exp(\varepsilon)+\sum_{j\neq s}\exp(X\psi_j)) \quad (5)$$

Moreover, the following transformation is used:

$$\varepsilon^*_r = J_r(\varepsilon_r)=\Phi^{-1}(F_r(\varepsilon)) \quad (6)$$

where Φ is the cdf for the standard normal, and ε^*_r follows a standard normal. From which, Lee (1983) showed that an equation like (1) can be rewritten as:

$$y_r = \beta_r + a_r X - \sigma_r \rho_r \varphi[J_r(X\psi_r)]/ F_r(X\psi_r) + v_r \quad (7)$$

where σ^2_r=var (u_r), φ is the pdf for the standard normal and ρ_r is the correlation coefficient between u_r and ε^*_r. Moreover, E(v_r|X,Z)=0.

The Lee method (1983), which will be used in this analysis, consists of estimating a two-stage multinomial logit model, where the first-stage choice equation is based on equation (2) and the second-stage expenditure equation is based on equation (7). It should be emphasized that this Lee method is a generalization of the Heckman two-stage method of selection correction. As in the case of the Heckman method, the identification of equation (7) depends on both the existence of instrumental variables and the non-linearity of the selection part of the model. In principle, the non-linearity of the selection part of the model is sufficient to identify the parameters of the model, because this non-linearity helps break the relation between the selection part and the rest of the expenditure equation. However, as discussed below, we use instrumental variables to obtain independent variations in the first-stage choice equation that identify the second-stage expenditure equation.

To implement our two-stage multinomial model, it is necessary to identify variables that are distinct for the receipt of remittances in the first-stage equation, and for the determination of household expenditure in the second-stage equation. The model is identifiable if there is at least one independent variable in the first-stage choice function that is not in the second-stage expenditure function.

The main econometric problem lies in selecting the variables that should go into the equations. Identifying variables that are truly exogenous to the receipt of remittances is difficult. While some variables – such as age of household head – are probably exogenous to household decision-making, other variables – such as those relating to household

education – are more problematic. In the literature, the cleanest strategies for identifying exogenous variables affecting migration and/or the receipt of remittances have focused on short-term economic shocks. For example, Yang (2006) uses panel data from the 1997 Asian currency crisis to analyze how short-term changes in currency rates affect the value of international remittances received by Filipino households. Since our Ghana data come from a single, cross-sectional survey, we are not aware of any identifiable exogenous shocks to exploit in our data set.

To address the problem of endogenous variables, we construct two instrumental variables using the following procedure. Past research has found that migration networks are important in migration decisions and the receipt of remittances (e.g. Woodruff and Zenteno, 2007, Munshi, 2003). Since ethnicity and religion represent two important forms of association in Ghana, we assume that households in Ghana will form migration networks on the basis of ethnicity and religion. On this basis, we partitioned the data from the 2005/06 Ghana GLSS 5 Survey (sub-sample) into 15 ethno-religious groups. We defined these ethno-religious groups by classifying households according to five religious and three ethnographic groups. The five religious groups are: (1) Catholic and Anglican; (2) Presbyterian and Methodist; (3) Pentecostal, Spiritualist and other Christian; (4) Muslim; and (5) all others.[13] The three ethnographic groups include: (1) households belonging to ethnic groups representing 17% or more of the population in 1998/99 (e.g., Asante and other Akan); (2) households belonging to ethnic groups representing between 10% and 15% of the population in 1998/99 (e.g., Fanti, Ga-Adangbe, Ewe); and (3) all other households.[14]

Table 2 shows how the households in the Ghana data are distributed across the 15 ethno-religious groups. The table shows that three ethno-religious groups – groups, 3, 8 and 14 – account for 42 percent of the sample. The table also shows the two variables that are used as instrument variables in this paper: (1) international remittances (from African or other countries) received as a percent of household income in the ethno-religious group; and (2) international migrants (to African or other countries) as a percent of the population of the ethno-religious group.

According to Table 2, international remittances and migrants are distributed quite unevenly among the various ethno-religious groups. This uneven distribution suggests that some ethno-religious groups are more "efficient" than others, if we measure efficiency by how much remittance income is received by households in the different groups. For example, focusing on the three largest ethno-religious groups in Table 2 (groups 3, 8 and 14), we see that each group accounts for about 14 percent of the sample. However, each group produces international migrants at different rates (less than one percent for groups 8 and 14, and 3.1 percent for group 3), and receives remittances at different rates (between 5 and 8 percent of observed household income for each group). This variation in the efficiency of migrant networks to generate remittance income is important to our analysis because it helps explain why these variables work well as instruments in our econometric procedure. In the next section we present tests that demonstrate the validity and strength of these instruments.

3. Specifying and Identifying the Econometric Model

In specifying the model we use the two instrumental variables discussed above to obtain independent variations in the first stage-choice equation that serve to identify the second- stage expenditure equation. The rationale for using these two variables as instruments is that they are correlated with the size and efficiency of the ethno-religious group in producing migrants and in generating remittances. Our identifying assumption is that conditional on a given set of covariates, these instrumental variables do not belong in the second-stage expenditure equation. We will be more specific on our identifying assumption shortly.

The first-stage choice equation of the model can be estimated as follows:

Prob (Y = receive remittances) = f [Human Capital (Number of household members with primary, junior secondary, secondary or university education), Household Characteristics (Age of household head, Square of the Age of household head, Household size, Number of males over age 15, Number of children under age 5), Migration Networks, (Number of female-headed households receiving internal remittances (from Ghana) in 1998/99, Number of female-headed households receiving international remittances (from African or other countries) in 1998/99, Square of internal migrants in 1998/99), Ethno-religious Characteristics (Square of income of ethno-religious group), Instrumental Variables, Regional and Ethnic Variables, Interactions] (8)

The rationale for including these variables in the first-stage choice equation follows the standard literature on migration and remittances. According to the basic human capital model, human capital variables are likely to affect migration because more educated people enjoy greater employment and expected income-earning possibilities in destination areas (Schultz, 1982; Todaro, 1970).[15] In the literature household characteristics – such as age of household head and number of male members and children – are also hypothesized to affect the probability of migration and the receipt of remittances. In particular, some analysts (Adams, 1993; Lipton, 1980) have suggested that migration is a life-cycle event in which households with older heads, more males over age 15 and fewer children under age 5 are more likely to participate. With respect to migration networks, the sociological literature has stressed the importance of family and village networks in encouraging migration (Massey, Goldring and Durand, 1994; Massey, 1987). For this reason, the first-stage equation includes three variables measuring migration networks at the level of the ethno-religious group: the number of female-headed households receiving internal remittances (from Ghana) in 1998/99; the number of female-headed households receiving international remittances (from African or other countries) in 1998/99); and the square of the number of internal migrants in 1998/99. Each of these network variables is measured at the level of the ethno-religious group for the year of the last Ghana GLSS Survey (GLSS 4 in 1998/99). The first-stage equation also includes the two instrumental variables discussed above, as well as the control variable, square of income in the ethno-religious group of the household. The reason for including this control variable is that social networks influence the choices of households both directly and indirectly. For example, while a household can benefit directly from a social network if it has a household member

who migrated, a household can also benefit even if it does not have a household member who migrated, simply because social groups that receive more remittances will likely have more access to resources to start a business or other entrepreneurial activity. This externality effect can be controlled for by using an indicator of group wealth, such as the square of income of the ethno-religious group.

The identification assumption of our model is then that conditional on the observable characteristics of the households, observable characteristics of the ethno-religious groups, and regional and ethnic dummies, that our instrumental variables are uncorrelated with the unobserved components of the expenditure equation. This assumption is tested formally by a series of tests reported in Table 3. The Anderson test (under-identification test) examines whether our instruments identify the equations, while the Cragg-Donald test (weak identification test) analyzes whether our instruments suffer from the weak instrument problem. The Anderson and Cragg-Donald test show that our instruments identify the second-stage equation and that our instruments are reasonably strong. [16] It is important to mention that these tests were done on a linear version of the model. Given that the non-linearity of the model helps to identify the selection term in equation (4,) we believe that these tests are sufficient to show the importance of our instruments.

The second-stage expenditure equation of the model can be estimated as follows:

Household expenditure = g[Human Capital (Number of household members with primary, junior secondary, secondary or university education), Household Characteristics (Age of household head, Square of the Age of household head, Household size, Number of males over age 15,

Number of children under age 5), Migration Networks, (Number of female-headed households receiving internal remittances (from Ghana) in 1998/99, Number of female-headed households receiving international remittances (from African or other countries) in 1998/99, Square of internal migrants in region in 1998/99), Ethno-religious Characteristics (Square of income of ethno-religious group), Regional and Ethnic Variables. Interactions]

(9)

In the second-stage equation the dependent variable is household expenditure, rather than household income, for the reasons noted above. The rationale for including the various variables in equation (9) is similar to that for including them in the first-stage choice equation.

4. Estimating the Econometric Model with Selection Controls

Table 4 shows the results for the first-stage choice equation of the model. In the table most of the human capital variables are statistically insignificant; however, the variables for number of household members with secondary and university education are positively and significantly related to the probability of receiving international remittances (from African or other countries). In the table only one household characteristic is significantly related to the receipt of either internal or international remittances: number of males over age 15 (negative). This result suggests that households with more male members of working age are less likely to receive remittances. The table also reveals that

households that live in ethno-religious regions with more income have a higher probability of receiving international remittances

Table 5 shows the results for the second-stage expenditure equation. For two of the three groups of households – those with no remittances and those with internal remittances – more human capital is associated with higher levels of expenditure. With respect to household characteristics, most of the variables are statistically insignificant. However, as might be expected, larger households and those with more children under age 5 have significantly lower levels of per capita expenditure.

In Table 5 it is important to note that the selection control variables (lambda) are insignificant for all three groups of households. This means that controlling for the observable characteristics of the households, the observable characteristics of the ethno-religious groups, the regional and ethnic dummies, and the various interaction terms included in the model, selection in unobservable characteristics is not a problem for households receiving either internal or international remittances in Ghana.

5. Estimating Predicted Expenditure Functions for the No Migration/Remittance Counterfactual

This section discusses how counterfactual expenditure estimates for households in the no migration/remittance situation can be developed by using predicted expenditure equations to identify the expenditures of households with and without internal and international remittances. The methodology for obtaining these estimates follows the literature on the evaluation of programs for the case in which instrumental variables are available (Maddala, 1983; Wooldridge, 2002)

The methodology includes three steps. First, we start with observed expenditures, meaning the levels of expenditures reported by households in the survey. Second, we obtain predicted expenditures for households of type j, conditional on them choosing type j:

$$E(y_{j|I=j}) = \beta_j + a_j X - \sigma_j \rho_j \varphi[J_j(X\psi_j)]/ F_j(X\psi_j) \quad (10)$$

Third, we obtain counterfactual expenditures for households, defined as the expected value of expenditures for households of type r, conditional on them choosing type j:

$$E(y_{r|I=j}) = \beta_r + a_r X - \sigma_r \rho_{rj} \varphi[J_j(X\psi_j)]/ F_j(X\psi_j) \quad (11)$$

Where σ^2_r=var (u_r), φ is the pdf for the standard normal and ρ_{rj} is the correlation coefficient between u_r and ε^*_j. Notice that we do not observe ρ_{rj}, so we make the assumption that $\rho_{rj=}\ \rho_j$.

It is important to estimate σ_r for each equation. For this reason, equation (11) is estimated in two steps: (1) first, we estimate equation (7) for all types of households; and (2) second, we subtract from equation (7) $\sigma_r \rho_r \varphi[J_r(X\psi_r)]/ F_r(X\psi_r)$ and add the term $[\sigma_j \rho_j \varphi[J_j(X\psi_j)]/ F_j(X\psi_j) y_j\ ]^*(\ \sigma_r / \sigma_j\ )$. Finally, we compare equation (10) and equation (11) which gives the effect of remittances on the treated:

Effect of remittances on households of type j= $E(y_{j|I=j}) - E(y_{r|I=j})$ (12)

It should be emphasized that this measure of the effect of remittances on the treated is not contaminated by differences in either observable or unobservable characteristics. This would happen only if we compared observed expenditure values for households receiving remittances with observed expenditure values for households receiving no remittances.

6. Expenditures, Remittances and Poverty

Table 6 reports observed, predicted and counterfactual expenditures for the three groups of households: those receiving no remittances, those receiving internal remittances (from Ghana) and those receiving international remittances (from African and other countries). On the basis of these expenditure levels, the table also reports levels of poverty based on a poverty line of 3,066,582 cedis/person/year which is equal to the poverty line used by the Ghana Statistical Service in 1998/1999, updated by inflation.[17]

Three different poverty measures appear in Table 6. The first measure -- the poverty headcount -- shows the percent of the population living beneath the poverty line. However, this headcount index ignores the "depth of poverty," that is, the amount by which the average expenditure of the poor fall short of the poverty line. The table therefore reports a second measure, the poverty gap. This index measures in percentage terms how far the average expenditures of the poor fall short of the national poverty line. The third poverty measure -- the squared poverty gap – shows the "severity of poverty." The squared poverty gap index possesses useful analytical properties, because it is sensitive to changes in distribution among the poor. In other words, while a transfer of expenditures from a poor person to a poorer person will not change the headcount index or the poverty gap index, it will decrease the squared poverty gap index.[18]

Columns (1) and (2) of Table 6 show that households with no remittances have mean per capita expenditures that situate them in the middle of the expenditure distribution of Ghana. For this reason, households with no remittances have less observed poverty on average than households receiving internal remittances (from Ghana), but more observed

poverty than households receiving international remittances (from African or other countries).

Column (3) of Table 6 shows that for observed expenditures, households receiving internal remittances (from Ghana) have the lowest mean per capita expenditure and have the highest observed poverty on average of all the household groups. However, the poverty status of this group of households improves considerably with the receipt of remittances. Comparing the predicted poverty values in column (4) with the counterfactual poverty values in column (5) shows that for households with internal remittances, the receipt of internal remittances reduces the poverty headcount of this group of households by 69.4 percent and the poverty gap by 42.7 percent.

Remittances also play an important role for households receiving international remittances (from African or other countries). Column (6) shows that for observed expenditures, households receiving international remittances have the highest mean per capita expenditure and the lowest observed poverty on average of all the household groups. Moreover, the economic status of this group of households improves even further with the receipt of remittances. Comparing the predicted poverty values in column (7) with the counterfactual poverty values in column (8) shows that for households with international remittances, the receipt of international remittances reduces the poverty headcount of this group of households by 88.1 percent, and the poverty gap by 90 percent.

Table 6 also shows that remittances have a negative impact on income inequality in Ghana. For households with internal remittances, comparing the predicted inequality values in column (4) with the counterfactual inequality values in column (5) shows that for this group of households the receipt of internal remittances increases the Gini coefficient

by 4.0 percent. For households with international remittances, comparing the predicted and counterfactual values in columns (7) and (8) shows that for this group of households the receipt of international remittances raises the Gini coefficient by 17.4 percent. In other words, international remittances increase inequality in Ghana more than internal remittances.

7. Remittances, Poverty and Inequality

One of the more interesting findings in Table 6 is that international remittances generally have a greater impact on reducing poverty and increasing inequality than internal remittances. The only exception to this statement is that for the severity of poverty (squared poverty gap), the receipt of international remittances reduces poverty less than the receipt of internal remittances. The question therefore arises: Why do international remittances generally have a greater impact on reducing poverty and increasing inequality than internal remittances?

One way of answering this question is to examine what kinds of expenditure groups of households receive internal and international remittances. If, for example, households at the bottom of the expenditure distribution are receiving more international than internal remittances or if these "poor" households are receiving a greater proportion of their expenditures from international remittances, then international remittances will have a greater impact on poverty and inequality than internal remittances.

To pursue this analysis, Table 7 ranks all the households into decile groups on the basis of predicted per capita household expenditure (excluding remittances). Columns (1) and (4) then show the proportion of total households receiving internal and international

remittances, respectively, in each decile group. Columns (2) and (5) show the distribution of internal remittance-receiving and international remittance-receiving households, respectively, in each decile group. For those households receiving remittances, columns (3) and (6) show the percent of total per capita household expenditure (including remittances) coming from internal or international remittances in each decile group.

In Table 7 it is useful to focus on the three lowest decile groups, which include all those households falling under the poverty line of 3,066,582 cedis/person/year. If these three lowest deciles represent the "poor" in Ghana, then columns (2) and (4) of the table show that the proportion of poor households receiving internal remittances is much larger than the proportion of poor households receiving international remittances (12-25 percent for internal remittances vs. 1-3 percent for international remittances). In other words, poor households are much more likely to receive internal remittances than international remittances. However, in examining the impact of remittances on poverty, it is also important to consider the amount of money being received by remittance-receiving households. Even though relatively few poor households receive international remittances, the average value of remittances (including money, food, goods) received by international remittance-receiving households is about 4 times that of the value of remittances received by internal remittance-receiving households (3,488,352 vs. 982,239 cedis). For this reason, when households receive international remittances they tend to improve their economic status much more dramatically than when households receive internal remittances. For instance, column (6) of Table 7 show that for households located right near the poverty line – that is, households in the third decile group – international remittances represent 62.2 percent of total per capita household expenditure. Thus, when remittances are included in

the expenditures of households receiving international remittances, the relatively small number of international remittance-receiving households that were poor before the receipt of remittances register very large improvements in their expenditures. As a result, the level and depth of poverty (poverty headcount and poverty gap) change more when remittances are included in the expenditures of households receiving international remittances than when remittances are included in the expenditures of households receiving internal remittances.

Table 7 also helps answer the question: Why do international remittances have a greater effect on increasing income inequality than internal remittances? Focusing on the two top decile groups, columns (2) and (4) of the table show that far more households receiving international remittances are located in the top end of the expenditure distribution (8-12 percent for international remittances versus 1-3 percent for internal remittances). The fact that households receiving international remittances are well-off to begin with, coupled with the very large improvements in expenditure that come with the receipt of international remittances, means that the receipt of international remittances has a greater effect on raising income inequality than the receipt of internal remittances.

8. Conclusion

This paper has used a new, 2005/06 nationally-representative household survey to analyze the impact of internal and international remittances on poverty and inequality in Ghana. Three key findings emerge.

First, with respect to methodology, this paper develops counterfactual expenditure estimates for migrant and non-migrant households by using econometric estimations to predict the expenditures of households with and without remittances. Since this method is problematic in the presence of selection bias, the paper uses a two-stage multinomial logit model to test for selection bias in the household receipt of remittances. To ensure the exogeneity of variables, the selection model is estimated using an instrumental variables approach focusing on variations in migration networks and remittances among various ethno-religious groups in Ghana. We find that controlling for the observable characteristics of the households, the observable characteristics of the ethno-religious groups, and regional and ethnic dummies, that selection in unobservable characteristics is not a problem for households receiving internal or international remittances in Ghana.

Second, using the expenditure results of the two-stage model to estimate predicted and counterfactual expenditures for households with and without remittances, the paper finds that both internal and international remittances reduce the level, depth and severity of poverty in Ghana. However, the size of the poverty reduction depends on the type of remittances being received. In general, international remittances have a greater impact on reducing poverty than internal remittances. For example, comparing the predicted and the counterfactual values for the poverty headcount measure shows that the inclusion of

international remittances reduces the level of poverty by 88.1 percent versus 69.4 percent for internal remittances.

Third, this study shows that both internal and international remittances have a negative impact on income inequality, as measured by the Gini coefficient. Comparing the predicted and the counterfactual values for the Gini coefficient shows that the inclusion of internal remittances raises income inequality by 4 percent versus 17.4 percent for international remittances. International remittances have a more negative impact on income distribution because households receiving international remittances are not poor in the first place, and with the receipt of remittances they tend to improve their expenditure status much more dramatically than households receiving internal remittances.

Table 1. Summary Data on Non-Remittance and Remittance-Receiving Households, Ghana, 2005/06 (sub-sample)

Variable	Receive no remittances (1)	Receive internal remittances (from Ghana) (2)	Receive international remittances (from African or other countries) (3)	t-test (Internal remittances vs. no remittances) (4)	t-test (International remittances vs. no remittances) (5)
Human Capital					
Number of members over age 15 with primary school	0.35 (0.62)	0.32 (0.57)	0.21 (0.45)	-0.027 (-1.27)	-0.139*** (-3.26)
Number of members over age 15 with junior secondary school	0.72 (0.90)	0.55 (0.78)	0.89 (0.94)	-0.166*** (-5.36)	0.172*** (2.78)
Number of members over age 15 with senior secondary school	0.11 (0.38)	0.07 (0.30)	0.23 (0.50)	-0.030** (-2.30)	0.121*** (4.60)
Number of members over age 15 with university	0.03 (0.22)	0.01 (0.10)	0.07 (0.27)	-0.027*** (-3.90)	0.040*** (2.89)
Household Characteristics					
Age of household head (years)	43.38 (14.13)	48.42 (18.40)	45.34 (15.46)	5.037*** (9.10)	1.954* (1.77)
Household size	4.19 (2.78)	3.68 (2.58)	3.28 (2.20)	-0.516*** (-5.39)	-0.907*** (-4.75)
Number of males over age 15	1.18 (0.90)	0.91 (0.90)	0.97 (0.85)	-0.273*** (-8.50)	-0.212*** (-3.31)
Number of children under age 5	.56 (0.81)	0.49 (0.73)	0.24 (0.52)	-0.074*** (-2.69)	-0.319*** (-5.81)
Mean per capita expenditure (thousand cedis)	6,404 (7,615)	5,545 (4,699)	12,600 (11,500)	-859*** (-3.38)	6,196*** (12.24)
N	2515	1159	210		

Table 1. Summary Data on Non-Remittance and Remittance-Receiving Households (contd)

Notes: N = 3,884 households. All values are weighted; standard deviations in parentheses with the exception of columns (4) and (5) that show T-tests. In 2006, US$ 1.00 = 9,000 Ghanaian cedis.

Source: 2005/06 Ghana GLSS 5 Survey (sub-sample).

* Significant at the 0.10 level.
** Significant at the 0.05 level.
*** Significant at the 0.01

Table 2. Ethno-religious groups of Ghana and Instrumental variables

Ethno-religious group	Number of households	Percent of households	International remittances (from African or other countries) received as percent of household income in group	International migrants(to African or other countries) as percent of population in group
1	205	5.28	7.2%	2.75%
2	239	6.15	6.1%	4.62%
3	550	14.16	7.0%	3.16%
4	44	1.13	10.2%	3.45%
5	110	2.83	6.5%	2.06%
6	193	4.97	4.9%	0.87%
7	245	6.31	8.2%	0.77%
8	572	14.73	5.0%	0.38%
9	42	1.08	2.9%	1.19%
10	159	4.09	2.9%	0.38%
11	234	6.02	1.4%	0.52%
12	104	2.68	7.9%	0.23%
13	269	6.93	1.6%	0.45%
14	547	14.08	8.3%	0.98%
15	371	9.55	2.9%	0.32%
Total	3884	100.00		

Source: 2005/06 Ghana GLSS 5 Survey (sub-sample)

Table 3. Tests for validity of instruments, Linear IV model

	Tests		
Instruments	**Anderson LM** **(Under-identification)**	**Cragg-Donald** **(Weak identification)**	**Sargan** **(Over-identification)**
International remittances (from African or other countries) as percent of household income **International migrants (to Africa or other countries) as percent of population**	Chi^2 (1) 12.73	Wald F Stat 6.32 Stock-Yogo (2005) values 10% max IV 7.03 15% max IV 4.58	NA (exactly identified)

Table 4. Multinomial Logit Model for Ghana

Variable	Receive internal remittances (from Ghana)			Receive international remittances (from African or other countries)		
Human Capital	**Coefficient**	**Z**	**Marginal effects**	**Coefficient**	**Z**	**Marginal effects**
Number of members over age 15 with primary school education	0.567***	2.59	1.16E-01	0.096	0.18	-4.07E-06
Number of members over age 15 with junior secondary school education	-0.111	-0.86	-2.27E-02	0.008	0.04	2.45E-06
Number of members over age 15 with secondary education	0.173	0.65	3.55E-02	0.865**	2.24	4.94E-05
Number of members over age 15 with university education	-0.730	-0.71	-1.50E-01	2.597**	2.35	1.70E-04
Household Characteristics						
Age of household head	0.004	0.03	-5.06E-02	0.381	1.01	2.30E-05
Square of age of household head	0.0002	0.19	5.00E-04	-0.004	-1.04	-2.43E-07
Household size	-0.026	-1.10	-5.40E-03	-0.034	-0.64	-1.61E-06
Number of males over age 15	-0.363***	-6.24	-7.44E-02	-0.342***	-2.90	-1.44E-05
Number of children under age 5	0.148	0.33	3.04E-02	-1.047	-0.88	-6.61E-05
Migration Networks						
Number of female-headed households receiving internal remittances (from Ghana) in group in 1998/99	1.581	1.53	3.24E-01	1.016	0.49	3.40E-05
Number of female-headed households receiving international remittances (from African or other countries) in group in 1998/99	0.539	0.29	1.10E-01	-4.942	-0.57	-3.09E-04
Square of internal migrants in group in 1998/99	-27.855	-0.42	-5.71E+00	130.126	0.74	8.38E-03
Ethno-religious group characteristic						
Square of income of ethno-religious group	3.21E-15	0.34	6.57E-10	5.13E-14***	2.57	3.06E-12
Instruments for second stage						
International remittances (from African or other countries) as percent of household income	27.596**	2.29	5.66E+00	-6.877	-0.32	-8.99E-04
International migrants (to Africa or other countries) as percent of population	-1.846	-0.73	-3.78E-01	-1.817	-0.22	-7.80E-05
Constant	-3.807	-1.09		-10.049	-1.13	
Log likelihood	-2789.04					
Likelihood ratio	676.06					
Pseudo R^2	10.81					
N	3884					

Table 4. Multinomial Logit Model for Ghana (contd)

Notes: Table reports the coefficients and marginal effects of a variable on the probability of a household receiving internal or international remittances. In addition to the variables listed in the table, we also include as control variables: the average number of rooms per capita in the region; interactions of age and squared age with the number of children below five years old in the household; interactions of age and squared age with the average number of rooms per capita in the region; interactions of squared age with seven ethnic dummies; the square of all the human capital variables; interactions of the human capital variables and the square of those variables with the number of children below five years old; and nine regional dummies and seven ethnic dummies. None of these variables are reported in the table. All values are weighted. Standard errors are clustered by ethno-religious group. They are bootstrapped standard errors.

*** Significant at the 0.01 level.
** Significant at the 0.05 level.
* Significant at the 0.10 level.

Table 5. Per Capita Household Expenditure Estimates (Selection Corrected) for Ghana, 2005/06

Variable	Receive no remittances	Receive internal remittances (from Ghana)	Receive international remittances (from African or other countries)
Human Capital			
Number of members over age 15 with primary education	-0.054 (-0.66)	-0.174 (-1.120)	-0.237 (-0.58)
Number of members over age 15 with junior secondary education	0.050 (1.40)	0.140** (2.230)	-0.019 (-0.17)
Number of members over age 15 with senior secondary education	0.276** (2.38)	0.067 (0.590)	0.094 (0.37)
Number of members over age 15 with university education	0.700*** (3.53)	1.485*** (3.400)	0.556 (0.48)
Household Characteristics			
Age of household head	-0.093*** (-4.06)	0.013 (0.270)	0.098 (0.33)
Square of age of household head	0.001*** (4.26)	0.0002 (-0.500)	-0.001 (-0.38)
Household size	-0.121*** (-12.04)	-0.131*** (-9.200)	-0.134*** (-2.93)
Number of males over age 15	0.058 (1.54)	0.060 (1.050)	0.025 (0.21)
Number of children under age 5	-1.030*** (-10.00)	-0.918*** (-6.450)	-0.819 (-0.66)
Migration Networks			
Number of female-headed households receiving internal remittances (from Ghana) in group in 1998/99	0.060 (0.22)	-1.020*** (-4.28)	0.028 (0.03)
Number of female-headed households receiving international remittances (from African and other countries) in group in 1998/99	1.036* (1.78)	-1.077 (-0.94)	1.273 (0.4)
Square of internal migrants in group in 1998/99	-13.578 (-0.70)	-10.032 (-0.380)	-7.497 (-0.14)
Ethno-religious group characteristic			
Square of income in ethno-religious group	3.5E-15 (1.17)	7.56E-15** (2.29)	-2.6E-15 (-0.21)
Lambda (Selection control)	0.008 (0.03)	-0.272 (-0.79)	-0.047 (-0.05)
Constant	17.917 (37.80)	17.813 (20.88)	15.534*** (2.03)
Adjusted R^2	49.79	53.51	52.69
Implied residual standard error	.5693	.5441	.4842
N	2515	1159	210

Table 5. Per Capita Household Expenditure Estimates (Selection Corrected) (contd)

Notes: Dependent variable is annual per capita household expenditure (including remittances). In addition to the variables listed in the table, we also include as control variables: the average number of rooms per capita in the region; interactions of age and squared age with the number of children below five years old in the household; interactions of age and squared age with the average number of rooms per capita in the region; interactions of squared age with seven ethnic dummies; the square of all the human capital variables; interactions of the human capital variables and the square of those variables with the number of children below five years old; and nine regional dummies and seven ethnic dummies. None of these variables are reported in the table. All values are weighted. Standard errors are clustered by ethno-religious group. Figures in parentheses are t-values.

*** Significant at the 0.01 level.
** Significant at the 0.05 level.
* Significant at the 0.10 level.

Table 6. Effects of Remittances on Poverty for Non-Remittance and Remittance-Receiving Households, Ghana, 2005/06

	Receive no remittances		Receive internal remittances (from Ghana			Receive international remittances (from African or other countries)			Internal remittances vs. no remittances	International remittances vs. no remittances
	Observed (1)	Predicted (2)	Observed (3)	Predicted (4)	Counterfactual (5)	Observed (6)	Predicted (7)	Counterfactual (8)	(4) vs (5)	(7) vs (8)
Poverty headcount (%)	30.24	21.26	35.43	12.81	41.86	4.87	.98	8.27	-69.40	-88.15
Poverty gap (%)	7.13	5.67	10.40	9.48	16.57	.21	.09	.90	-42.79	-90.00
Squared poverty gap (%)	.0007	.0006	.0030	.0031	.0068	.00006	.00003	.00006	-54.41	-50.00
Gini coefficient	.43	.29	.41	.26	.25	.39	.27	.23	4.00	17.39
Mean per capita household expenditure (thousand cedis)	6,402	5,278	5,545	4,740	3,577	12,600	11,000	6,201	32.51	77.39
N	2515	2515	1159	1159	1159	210	210	210	1159	210

Notes: Columns (1), (3) and (6) show observed household per capita expenditure. Columns (2), (4) and (7) show predicted household expenditures, using equation for households of type s, with households of type s (equation 10). Columns (5) and (8) use equation (11), which is for households with no remittances on households with internal remittances (column 5) and households with international remittances (column 8). These estimations adjust the selection term as explained in section 5 of paper. Poverty calculations made using poverty line of 3,066,582 Ghanaian cedis/person/year, which is the 1998/99 Ghana poverty line, updated for inflation. In 2006, US$ 1.00 = 9,000 Ghanaian cedis.

Source: 2005/06 Ghana GLSS 5 Survey (sub-sample).

Table 7: Proportion and Distribution of Remittance-Receiving Households by Decile Group, Ranked by Predicted Per Capita Household Expenditure, Excluding Remittances

Rank	Households receiving internal remittances in given decile (from Ghana)	Distribution of households receiving internal remittances (from Ghana)	Internal remittances as percent of total per capita household expenditure (including remittances) Observed	Households receiving international remittances in given decile (from African or other countries)	Distribution of households receiving international remittances (from African or other countries)	International remittances as a percent of total per capita household expenditure (including remittances) Observed
	(1)	(2)	(3)	(4)	(5)	(6)
(decile)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Lowest 10	48.42	25.19	8.00	1.00	2.86	11.27
Second 10	40.86	14.84	57.22	1.43	2.86	8.67
Third 10	37.85	12.77	11.27	2.56	4.76	62.18
Fourth 10	36.83	11.82	15.60	3.49	6.19	21.75
Fifth 10	33.52	10.18	19.67	4.83	8.10	28.34
Sixth 10	27.84	8.46	17.12	9.66	16.19	26.51
Seventh 10	21.57	6.38	19.06	6.41	10.48	17.64
Eighth 10	19.71	5.87	19.58	8.12	13.33	40.74
Ninth 10	11.90	3.62	21.20	12.18	20.48	28.42
Top 10	2.84	0.86	35.62	8.81	14.76	22.93
Total		100.00			100.00	

Notes: Households ranked into decile groups on the basis of predicted per capita household expenditure (excluding remittances). Predicted household expenditure is based on equation (10) in text. However, data on remittance reception and the amount of remittances received is based on observations. Columns (1) and (4) show the proportion of households receiving remittances in the given deciles. Columns (2) and (5) show the distribution of remittances by deciles. Columns (3) and (6) show remittances as a fraction of household expenditure (including remittances).

Source: 2005/06 Ghana GLSS 5 Survey (sub-sample).

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Notes

[1] The following studies have analyzed the impact of remittances on poverty and inequality in Latin America and Asia: Acosta et al (2006) on Latin America, Lokshin et al (2007) on Nepal, Adams on Guatemala (2004), Taylor, Mora and Adams on Mexico (2005) and Yang and Martinez on the Philippines (2005).

[2]Studies on remittances and poverty in Sub-Saharan Africa include: Litchfield and Waddington on Ghana (2003) and Gustafsson and Makonnen on Lesotho (1993).

[3] According to the Ghana Statistical Service (2000: Table 2), in 1998/99 the poverty headcount index in Ghana was 39.5 percent. This index measures the share of the population living below the poverty line.

[4] According to the 2005/06 Ghana GLSS 5 Survey (sub-sample), roughly five times as many households in Ghana receive internal as opposed to international remittances (1159 versus 210 households, respectively). However, the average value received of internal remittances is only about 30 percent that of international remittances: 982,239 versus 3,488,352 Ghanaian cedis/person/year, respectively. See text.

[5] For other attempts to treat remittances as a substitute for home earnings and to predict (estimate) the incomes of households with and without migration, see Barham and Boucher (1998) and Adams (1991).

[6] This migration and remittances module included about 45 questions on the socio-economic characteristics of current migrants, including their age, educational status, occupation and amount of remittances (cash, food and non-food goods) sent home.

[7] Non-food goods include such items as household appliances (stoves, refrigerators), vehicles and equipment.

[8] In the 2005/06 Ghana GLSS 5 Survey (sub-sample) only 49 percent of internal migrants (within Ghana) and 68 percent of international migrants (to African and other countries) remit. These figures are similar to those observed in other countries. For example, in their study in the Dominican Republic, de la Briere, Sadoulet, de Janvry and Lambert (2002) find that only one- half of all international migrants remit.

[9] In the 2005/06 Ghana GLSS 5 Survey (sub-sample) 56 percent of households receiving internal remittances (from Ghana) and 50 percent of households receiving international remittances (from African or other countries) do not have a migrant. On average, non-migrant households that receive remittances receive less in per capita remittances than migrant households that receive remittances.

[10] This paper will follow the convention of using expenditure rather than income data to examine poverty in Ghana for the following reasons. First, since households tend to use savings to smooth fluctuations in income, many economists believe that expenditures provide a more accurate measure of household welfare over time. Second, in developing country situations like Ghana, expenditures are typically easier to measure than income because of the many problems inherent in defining and measuring income for the self-employed in agriculture, who represent such a large proportion of the labor force.

[11] See Schmertmann (1994) for a more formal and detailed explanation of this multinomial logit selection model.

[12] Ideally, we would like to model both the household decision of sending migrants and the household decision to receive remittances. However, as explained in the data section, this cannot be done because of the limited number of households (n=184) producing international migrants.

[13] Eleven religious groups are listed in the 2005/06 Ghana GLSS 5 Survey (sub-sample). The largest of these groups is Catholic, accounting for 15.9 percent of all households. Other large religious groups include: "other Christian" (15.5 percent), Pentecostal (13.3 percent), Presbyterian (11.3 percent), Muslim (11.8 percent) and Methodist (9.8 percent).

[14] Over thirty ethnic groups are listed in the 2005/06 Ghana GLSS 5 Survey (sub-sample). The largest of these ethnic groups is the Asante group, accounting for 17.4 percent of all households. Other large ethnic groups in the survey include: "other Akan" (12.6 percent), Fanti (11.2 percent), Ewe (11.4 percent), and Ga-adangbe (8.4 percent)

[15] While early work on the human capital model found that education had a positive impact on migration (Schultz, 1982; Todaro, 1976), more recent empirical work in Egypt (Adams, 1991and 1993) and Mexico (Mora and Taylor, 2005; Taylor, 1987) has found that migrants are not necessarily positively selected with respect to education.

[16] Other variables measured at the level of the ethno-religious group were also tested as potential controls, but they turned out to be irrelevant. Similarly, other variables were also tested as potential instruments but they did not pass the over-identification test (Hansen J-test). We also performed a Hausman test that shows that coefficients from the IV estimation do not differ systematically from the coefficients from an OLS estimation. We chose to follow the IV estimation because of the strength of our instruments, which suggests that instruments are needed to reduce any possibility of endogeneity bias in our estimation.

[17] The 1998/99 poverty line is of 684,401 cedis/person/year, which is equivalent to the poverty headcount index of 39.5 percent that is cited as the 1998/99 poverty line for Ghana (Ghana Statistical Service, 2000: Table 2).This poverty line is defined as the level of per capita expenditures needed to meet the costs of meeting basic food and non-food requirements in Ghana. For more details on this expenditure-based poverty line, see Ghana Statistical Service (2000).

[18] This characteristic is called the weak transfers principle. The square poverty gap does not posses a third characteristic that is also desired in poverty measures. That characteristic is called the principle of transfer sensitivity, which establishes that a given regressive transfer between two poor people must increase the poverty index more when the persons involved are poorer (Ray, 1998).